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## On former and recent strandings of cetaceans on the coast of the Netherlands

By P. J. H. VAN BREE

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The Dutch zoologist Dr A. B. VAN DEINSE published during his long life a large number of reports on cetaceans stranded on the coast of the Netherlands. In these reports at first strandings were enumerated and discussed, which occurred over longer periods (VAN DEINSE 1931, 1946); later on he published yearly reports till his death in 1965. Then for a few years no yearly stranding lists were compiled until, at the end of 1969, the present author in close cooperation with Dr A. M. HUSSON of the Rijksmuseum van Natuurlijke Historie at Leiden started again to gather all the data concerning stranded whales and dolphins. At present three bi-annual reports on stranded cetaceans have been published (HUSSON and VAN BREE 1972, 1976; VAN BREE and HUSSON 1974), covering a period of six years. This period is long enough to take the data together (see table 1), to compare them with the data of similar periods in the past (see table 2), and to discuss the differences.

As stated already, stranding records from the Netherlands are available for a long time but to obtain comparable periods we have taken the ones given in table 2 (viz. 1931—1936, 1950—1955, 1970—1975). It was only after 1931 that VAN DEINSE had a good reporting system organized. To avoid the difficulties caused by World War II (e. g. beaches closed to visitors) and the little interest in strandings during the

Table 1

Strandings of cetaceans on the coast of the Netherlands during the period 1970—1975  
After HUSSON and VAN BREE (1972, 1976) and VAN BREE and HUSSON (1974)

|                                   | 1970 | 1971 | 1972 | 1973 | 1974 | 1975    |
|-----------------------------------|------|------|------|------|------|---------|
| <i>Physeter macrocephalus</i>     | 1    | —    | —    | —    | —    | —       |
| <i>Phocoena phocoena</i>          | 18   | 11   | 21   | 22   | 7    | 15      |
| <i>Globicephala melaena</i>       | 1    | —    | —    | —    | —    | —       |
| <i>Grampus griseus</i>            | 2    | —    | —    | —    | —    | 1       |
| <i>Tursiops truncatus</i>         | —    | —    | 1    | —    | 1    | 1 (+1?) |
| <i>Lagenorhynchus albirostris</i> | 1    | —    | 2    | 3    | 3    | 3       |
| <i>Lagenorhynchus acutus</i>      | —    | —    | —    | 1    | —    | —       |
| <i>Balaenoptera borealis</i>      | —    | —    | 1    | —    | —    | —       |
| <i>Balaenoptera acutorostrata</i> | —    | —    | —    | —    | 1    | —       |

first postwar years, we took 15 year intervals between the sampling periods in order to get a representative review. We are aware that a number of strandings in the past as well as during the last period were not reported. As these sampling errors are more or less the same for the three periods they may be ignored.

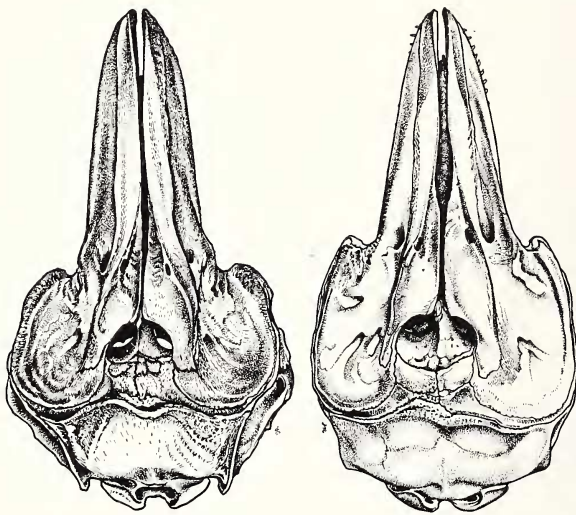


Fig. 1. Dorsal views of skulls of *Tursiops truncatus* (ZMA 8633) (at left) and *Lagenorhynchus albirostris* (ZMA 7617)

For a large number of cetaceans the rather shallow North Sea can be considered a huge trap. They enter from the north and being unadapted to shallow waters where they cannot find their normal food, they blunder around, weaken and are liable to beach. We can safely assume that all the specimens of those species of which there are less than six strandings in each six year period, are trapped ones, stragglers. That leaves us (see table 2) with the following species which can be considered as occurring normally in the Dutch coastal waters: Harbour Porpoise (*Phocoena phocoena*), Common Dolphin (*Delphinus delphis*), Bottle-nosed Dolphin (*Tursiops truncatus*), and White-beaked Dolphin (*Lagenorhynchus albirostris*). Only the changes in the frequency of strandings of these species are really interesting.

Table 2

Strandings of cetaceans on the coast of the Netherlands during three six-year periods  
After VAN DEINSE (1946—1958) and the data from table 1

|                                   | 1931—1936            | 1950—1955 | 1970—1975 |
|-----------------------------------|----------------------|-----------|-----------|
| <i>Physeter macrocephalus</i>     | 1                    | 1         | 1         |
| <i>Kogia breviceps</i>            | —                    | —         | —         |
| <i>Monodon monoceros</i>          | —                    | —         | —         |
| <i>Delphinapterus leucas</i>      | 1 (?)                | —         | —         |
| <i>Mesoplodon bidens</i>          | 1                    | 2 (+ 1?)  | —         |
| <i>Mesoplodon grayi</i>           | —                    | —         | —         |
| <i>Hyperoodon ampullatus</i>      | 2                    | 1         | —         |
| <i>Phocoena phocoena</i>          | unknown but abundant | 198 + x   | 94        |
| <i>Orcinus orca</i>               | 4                    | 1         | —         |
| <i>Pseudorca crassidens</i>       | 2                    | —         | —         |
| <i>Globicephala melaena</i>       | —                    | —         | 2         |
| <i>Delphinus delphis</i>          | 12                   | 12        | —         |
| <i>Stenella coeruleoalba</i>      | —                    | —         | —         |
| <i>Grampus griseus</i>            | —                    | —         | —         |
| <i>Tursiops truncatus</i>         | 44                   | 47        | 3 (+ 1?)  |
| <i>Lagenorhynchus albirostris</i> | 1                    | 3         | 12        |
| <i>Lagenorhynchus acutus</i>      | —                    | —         | 1         |
| <i>Balaenoptera physalus</i>      | 1                    | —         | —         |
| <i>Balaenoptera borealis</i>      | —                    | —         | 1         |
| <i>Balaenoptera acutorostrata</i> | —                    | 1         | 1         |

Before discussing these changes, however, the following remarks must be made. Up to the early fifties VAN DEINSE did not record the number of strandings of *Phocoena phocoena* on the Dutch coast. In his publications he noted under the heading Harbour Porpoise “always present” and in his preliminary yearly reviews of strandings sent to colleagues and correspondents he used for the species the sign “ $\cong$ ”. That formerly stranded Harbour Porpoises were very common indeed follows also from my own notes that during a walk along the beach between Zandvoort

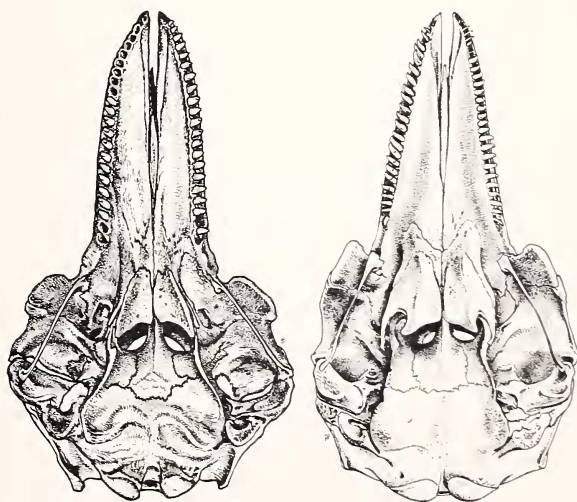


Fig. 2. Ventral views of skulls of *Tursiops truncatus* (at left) and *Lagenorhynchus albirostris*

and IJmuiden (a distance of about 10 km) in June 1948 I found 7 beached specimens. Only on the island of Terschelling during a two month stay in 1960 Mr H. ZWAAGSTRA could still collect for the Amsterdam Zoological Museum the remains of 8 Harbour Porpoises. More detailed notes on the former abundance of *Phocoena phocoena* in Dutch coastal waters can be found in the study by VERWEY (1975). Only after having received alarming reports on the sudden decline of stranded Porpoises and on the lack of observations of living animals at sea, VAN DEINSE started to record also stranded specimens of the species in 1951 (see table 2).

In the past several strandings of Bottle-nosed Dolphins (*Tursiops truncatus*) were reported which after the study of their remains in collections, turned out to be White-beaked Dolphins (*Lagenorhynchus albirostris*). But even if we assume that 15% of the Bottle-nosed Dolphins were misidentified during the VAN DEINSE period, it still remains true that there is a clear decline in the number of stranded specimens of this species. This also would signify that the increase of strandings of White-beaked Dolphins is less large than appears from the data in table 2. In relation to the errors made in identifying intact beached specimens I may refer to my notes published a few years ago (VAN BREE 1970). It also may be useful to picture once more the skulls of both species (see figs 1–3) to facilitate the identification of museum specimens.

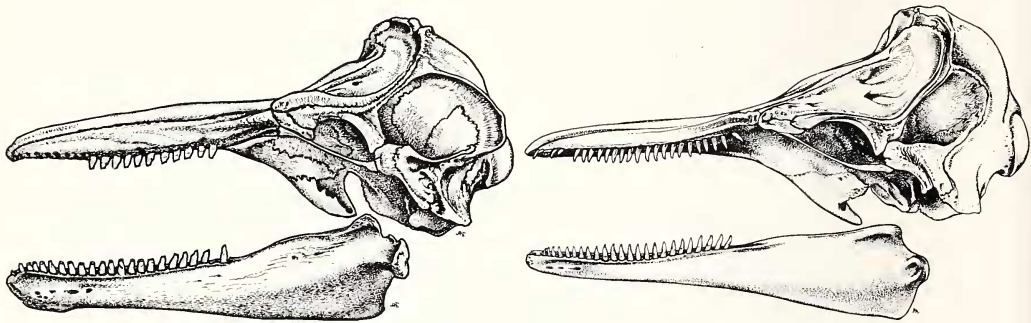


Fig. 3. Lateral views of skulls of *Tursiops truncatus* (at left) and *Lagenorhynchus albirostris*. All drawing Jos RUTING — ZMA fecit

For the Common Dolphin (*Delphinus delphis*) FRASER (1974) noted that since 1913 there is a progressive decline in the number of stranded specimens on the coasts of the British Isles. According to him, due to an invasion of the North Sea by the squid *Todarodes sagittatus* in 1937, concurrently more Common Dolphins were stranded on the east coasts of Scotland and England. For the coast of the Netherlands the situation differs from the one described by FRASER. Before 1931 the species was quite rare and there were sudden increases of strandings of Common Dolphins during the years 1933–1935 and 1940–1941 (VAN DEINSE 1946). In the period 1946 to 1956 two to four stranded *Delphinus delphis* were found yearly. VAN DEINSE related the incidence of strandings of this species to the changes in the water temperatures of the southern North Sea (caused by temporary influxes of rather warm Gulf Stream water). The higher the temperatures, the more strandings of this species. Without excluding the effects of a sudden invasion of the North Sea by a prey species (FRASER, see above), the explanation given by VAN DEINSE (loc. cit.) seems quite acceptable as during the last decades a slight gradual cooling of the waters of the North Sea has been observed. It also must be noted that *Delphinus delphis* is one of the few species of dolphin which enters the North Sea from the south as well as from the north.



The slight change in water temperature might also explain the increase of stranded White-beaked Dolphins (*Lagenorhynchus albirostris*). Formerly in the eastern Atlantic this species was commonly observed north of 55 degrees latitude. Nowadays large schools are often seen more to the south. Even specimens of a more boreal species than the White-beaked Dolphin, the White-sided Dolphin (*Lagenorhynchus acutus*), are found during the last years at more southern latitudes than formerly. For the White-beaked Dolphin one might also consider the possibility that by the decline of Bottle-nosed Dolphins in the coastal waters, the former starts to occupy the niche of the latter.

Could it be that changes in water temperatures might explain differences in the incidence of strandings of *Delphinus delphis* and *Lagenorhynchus albirostris*, temperature changes certainly do not play a role in the marked decline of strandings of the more ubiquitous species *Phocoena phocoena* and *Tursiops truncatus*, formerly the far most common species in the North Sea and adjacent waters. In a recently published paper on Harbour Porpoises and Bottle-nosed Dolphins from the area between Den Helder and the island of Texel, VERWEY (1975) treats also in detail the decrease in the strandings of both species. In his study he arrives at almost the same conclusions as will be given in this article. This is not so surprising as we both used partially the same data (though represented in a different way) and we had together long discussions on the subject.

VERWEY, basing himself on stranding data as well as on a large number of observations of living specimens, concludes that the decrease in the once very common Harbour Porpoise did not occur gradually but that two rather sudden changes can be recognized. The first probably took place around 1946 and VERWEY does not exclude the possibility that this decrease is linked to the dumping of war chemicals at that period or by the increase in the use of oil. One wonders whether not the clearing of the extensive mine-fields in the North Sea by mine-sweepers at that time also had a noxious influence, as it is known that the animals are very sensitive to underwater explosions.

A second strong decrease in the number of stranded Harbour Porpoises occurred around 1960. VERWEY concludes and I share his views, that this second decrease is clearly related to the increase of pollution of the North Sea, starting at first near the mouth of the river Rhine and spreading northwards along the Dutch coast later on. The toxic influences of chlorinated hydrocarbon compounds, polychlorinated biphenyls and heavy metals, chemical substances found after analysing tissue samples of stranded dolphins on the Dutch coast, are well known and this is not the place to review the extensive literature on this subject. For shortness sake I only refer here to the papers by KOEMAN et al. (1972), GASKIN et al. (1971) and HOLDEN and MARSDEN (1967). In Harbour Porpoises not only a decrease can be found in the number of stranded specimens but there is also a decrease in the mean total length of the stranded specimens as compared to earlier data (VAN BREE 1973). An analysis of this decrease in length (and in age) will be published elsewhere.

In the Bottle-nosed Dolphin a sudden decrease in the number of stranded specimens occurred later than in the Harbour Porpoise and well around 1965. As in *Phocoena phocoena*, the poisonous substances mentioned above are also responsible for the decline in the numbers of *Tursiops truncatus*. That *Tursiops* was affected later is most probably due to the fact that the species is less littoral than the Harbour Porpoise and probably due too to the fact that in relation to its migrations it stayed for shorter times in heavy polluted waters.

A factor causing a gradual decline in both species, though acting in different ways, is the augmentation of the human fishing efforts. It can safely be stated that the North Sea is at present overfished. That means for Bottle-nosed Dolphins a

decrease of the food supply, as the animals take also fishes of species and sizes preferred by men. In the Harbour Porpoise, who takes smaller preys, it is not the competition for food that plays a role but the modern fishing boats have such great speeds that Harbour Porpoises cannot outswim the fast moving nets, get caught and drown. Although there is a declining population of *Phocoena phocoena* in the North Sea, fishermen state that they get more specimens in their nets than formerly.

A probable factor which might also have caused a gradual decrease of odontocetes in the North Sea, a factor on which Dr J. VERWEY and the present author differ of opinion, is what I call "noise pollution". It is known that every motor, thus also ship motors, produces beside audible din, also an amount of ultrasonic noise. It is true that a number of dolphin species play in the bow waves of ships for a short time. But in these animals which are so sensible for ultrasonic sounds there is a great difference between playing beside a noisy ship for a short time than being subjected to the ultrasonic noises of several ships at the same time day and night. At present, whatever hour of the day, standing somewhere on the beach of the Netherlands one can count at least 8 to 10 ships passing by. South of Rotterdam and London the number of ships one can see at the same moment is still higher. I would be very surprised indeed if the ultrasonic noises of these ships would have no negative influence on the dolphin populations. I hereby do not take into account other negative influences as wounds caused by the propellor blades, the spilling of oil and the overboard dumping of waste.

Assuming it would be correct that due to a slight change in water temperature there is small shift to the south of the distribution area of the White-beaked Dolphin (*Lagenorhynchus albirostris*), we may expect that soon that species also will be affected by the pollution in the southern North Sea if it is not already affected at this moment by the ecological damages caused by oil drilling in the northern North Sea.

#### Summary

A review is given of the strandings of cetaceans on the coast of the Netherlands during three six-year periods (1931—1936, 1950—1955, 1970—1975) and the differences between the stranding frequencies are discussed. A distinction is made between strandings of stragglers and strandings of species occurring normally in the North Sea. The decrease in the number of stranded *Delphinus delphis* and the increase of stranded *Lagenorhynchus albirostris* may be related to a slight lowering of the temperatures of the southern North Sea during the last decades. The very marked decrease in strandings of *Phocoena phocoena* and *Tursiops truncatus* is related to the effects of pollution of the coastal waters of the Netherlands.

#### Zusammenfassung

##### *Über frühere und jüngste Strandungen von Cetaceen an der niederländischen Küste*

Vorgelegt wird eine Übersicht über Wal-Strandungen an der niederländischen Küste während dreier 6-Jahres-Perioden (1931—36, 1950—55, 1970—75). Diskutiert werden die Ursachen unterschiedlicher Strandungshäufigkeiten. Zu unterscheiden ist zwischen den Strandungen von Irgästen und regelmäßig in der Nordsee vorkommenden Arten. Die Abnahme gestrandeter *Delphinus delphis* und die Zunahme gestrandeter *Lagenorhynchus albirostris* könnte mit einem leichten Temperaturrückgang der Nordsee während der letzten Jahrzehnte in Verbindung gebracht werden. Die auffallende Abnahme der Strandungen von *Phocoena phocoena* und *Tursiops truncatus* steht im Zusammenhang mit einer Verunreinigung der niederländischen Küstengewässer.

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